

WHAT IS CLAIMED IS:

1. An elevator apparatus comprising:

a first driving machine having a first drive sheave, the first driving machine being disposed in an upper portion of a hoistway;

a second driving machine having a second drive sheave, the second driving machine being disposed in an upper portion of the hoistway;

a car raised and lowered inside the hoistway by a driving force from the first and second driving machines;

first and second counterweights raised and lowered inside the hoistway by a driving force from the first and second driving machines; and

a main rope body wound around the first and second drive sheaves, the main rope body suspending the car and the first and second counterweights inside the hoistway.

2. The elevator apparatus according to Claim 1, wherein:

the first and second driving machines are disposed horizontally such that axes of rotation of the first and second drive sheaves extend vertically.

3. The elevator apparatus according to Claim 1, wherein:

the main rope body has:

a first main rope having a first end portion connected to the car and a second end portion connected to the first counterweight, the first main rope being wound around the first drive sheave; and

a second main rope having a third end portion connected to the car and a fourth end portion connected to the second counterweight, the second main rope being wound around the second drive sheave.

4. The elevator apparatus according to Claim 1, wherein:
a contact angle of the main rope body relative to the first drive sheave and a contact angle of the main rope body relative to the second drive sheave are equal to each other.

5. The elevator apparatus according to Claim 1, wherein:
the car has mutually opposite first and second side surface portions; and

a first car return pulley for directing the main rope body from the first drive sheave toward the first side surface portion, a first counterweight return pulley for directing the main rope body from the first drive sheave to the first counterweight, a second car return pulley for directing the main rope body from the second drive sheave toward the second side surface portion, and a second counterweight return pulley

for directing the main rope body from the second drive sheave to the second counterweight are disposed in an upper portion of the hoistway.

6. The elevator apparatus according to Claim 5, wherein:
the first driving machine, the first car return pulley, and the first counterweight return pulley and the second driving machine, the second car return pulley, and the second counterweight return pulley are disposed centrosymmetrically to each other.

7. The elevator apparatus according to Claim 5, wherein:
first and second car suspension sheaves are disposed on a lower portion of the car;

the main rope body includes a main rope having:

a first end portion connected to the first counterweight; and

a second end portion connected to the second counterweight; and

the main rope is wound sequentially around the first counterweight return pulley, the first drive sheave, the first car return pulley, the first car suspension sheave, the second car suspension sheave, the second car return pulley, and the second counterweight return pulley from the first end portion

to the second end portion.

8. The elevator apparatus according to Claim 1, further comprising:

a contact angle adjusting means for adjusting a contact angle of the main rope body relative to the first and second drive sheaves by changing a direction of the main rope body extending from at least one of the first and second drive sheaves.

9. The elevator apparatus according to Claim 1, further comprising:

a control apparatus for controlling the first and second driving machines by operating modes including a double operating mode in which the first and second driving machines are both driven simultaneously, and a single operating mode in which only one of the first and second driving machines is driven.

10. An elevator apparatus comprising:

a first driving machine having a first drive sheave, the first driving machine being disposed in an upper portion of a hoistway;

a second driving machine having a second drive sheave, the second driving machine being disposed in an upper portion of the hoistway;

a car raised and lowered inside the hoistway by a driving force from the first and second driving machines, the car having mutually opposite first and second side surface portions;

a counterweight raised and lowered inside the hoistway by a driving force from the first and second driving machines;

a main rope body wound around the first and second drive sheaves, the main rope body suspending the car and the counterweight inside the hoistway;

a first car return pulley disposed in an upper portion of the hoistway, the first car return pulley directing the main rope body from the first drive sheave toward the first side surface portion;

a first counterweight return pulley disposed in an upper portion of the hoistway, the first counterweight return pulley directing the main rope body from the first drive sheave to the counterweight;

a second car return pulley disposed in an upper portion of the hoistway, the second car return pulley directing the main rope body from the second drive sheave toward the second side surface portion;

a second counterweight return pulley disposed in an upper portion of the hoistway, the second counterweight return pulley directing the main rope body from the second drive sheave to the counterweight;

a first deflection pulley disposed in an upper portion of the hoistway, a portion of the main rope body between the first drive sheave and the first car return pulley being wound around the first deflection pulley;

a second deflection pulley disposed in an upper portion of the hoistway, a portion of the main rope body between the second drive sheave and the second car return pulley being wound around the second deflection pulley,

wherein:

the first and second driving machines are disposed horizontally such that axes of rotation of the first and second drive sheaves extend vertically.

11. The elevator apparatus according to Claim 10, further comprising:

a car suspension sheave mounted to the car; and

a counterweight suspension sheave mounted to the counterweight,

the main rope body being wound endlessly around the first drive sheave, the first deflection pulley, the first car return pulley, the car suspension sheave, the second car return pulley, the second deflection pulley, the second drive sheave, the second counterweight return pulley, the counterweight suspension sheave, and the first counterweight return pulley.

12. An elevator apparatus comprising:

a driving machine having a drive sheave, the driving machine being disposed in an upper portion of a hoistway;

a car raised and lowered inside the hoistway by a driving force from the driving machine;

first and second counterweights raised and lowered inside the hoistway by a driving force from the driving machine; and

a main rope body wound around the drive sheave, the main rope body suspending the car and the first and second counterweights inside the hoistway,

wherein:

the main rope body includes:

a first main rope connected to the first counterweight; and

a second main rope connected to the second counterweight; and

the driving machine is disposed horizontally such that an axis of rotation of the drive sheave extends vertically.

13. An elevator apparatus comprising:

a driving machine having a drive sheave, the driving machine being disposed in an upper portion of a hoistway;

a car raised and lowered inside the hoistway by a driving

force from the driving machine;

a counterweight raised and lowered inside the hoistway
by a driving force from the driving machine;

a main rope body wound around the drive sheave, the main
rope body suspending the car and the counterweight inside the
hoistway;

a car suspension sheave mounted to the car, the main rope
body being wound around the car suspension sheave;

a car return pulley disposed in an upper portion of the
hoistway, the car return pulley directing the main rope body
extending from the drive sheave to the car suspension sheave;
and

a counterweight return pulley disposed in an upper portion
of the hoistway, the counterweight return pulley directing the
main rope body extending from the drive sheave to the
counterweight,

wherein:

the main rope body has:

a first end portion connected to a rope connecting
portion fixed to an upper portion of the hoistway;
and

a second end portion connected to the
counterweight,

the main rope body being wound sequentially around the

car suspension sheave, the car return pulley, the drive sheave, and the counterweight return pulley from the first end portion; and

the driving machine is disposed horizontally such that an axis of rotation of the drive sheave extends vertically.